

APPENDIX G

I-PLAN

for

LAND USE/LAND COVER

LAND USE/LAND COVER IMPLEMENTATION PLAN

1. EXECUTIVE SUMMARY

Land Use and Land Cover (LULC) data are used for a wide variety of local, national, and regional applications, including watershed management, environmental inventories, transportation modeling, fire risk assessment, and land management. LULC data is becoming more important as Idaho's population grows and the landscape changes.

Idaho will build on existing national LULC mapping programs. The National Land Cover Data (NLCD) and the Gap Analysis Program (GAP) are national programs that have Idaho LULC data available statewide. Standards from the US Geological Survey (USGS) High Resolution (HR) LULC Mapping program are recommended for local and regional mapping projects in Idaho. The HR LULC mapping program offers opportunities for cost-sharing agreements with other agencies and USGS.

2. DESCRIPTION

2.1 Theme Description

Land Use describes the economic and cultural activities at a location. Land Cover describes the physical features of an area. Both Land Use and Land Cover information are critical to support government decision making for managing the state's cultural and natural resources. As Idaho's population grows and LULC gradually changes, having current and historic LULC data is vitally important to manage the state's resources.

Agency and project needs for LULC data vary widely. These needs drive differences in LULC classes of interest, levels of detail, accuracy, and currency.

2.2 Vision Statement

Idaho has a current, statewide LULC dataset available to all on INSIDE Idaho. Standards from the USGS HR LULC mapping program are widely accepted and consistently used for developing HR LULC data for projects in local areas.

2.3 Interdependencies

Orthoimagery is a framework dataset that can be used as base images to develop HR (at least 1:24,000-scale) LULC data. Medium resolution LULC data is usually developed from satellite images that may have taken ground control points from orthophotos to orthorectify the satellite images.

Other framework datasets, such as hydrography, watersheds, cadastral, and transportation, are often analyzed together with LULC data in a GIS, so it is vitally important that the LULC data align well with the other framework data.

3. BENEFITS AND RISKS

3.1 Benefits and Driving Issues

Many federal, state, regional, and local government agencies require current and sometimes historical LULC data to help make informed decisions about the state's cultural and natural resources. For this reason, high-quality, recent LULC data is a priority.

3.2 Risk Analysis

Not having current, reliable LULC data risks management decisions made based on dated or poor quality data.

4. INVENTORY

4.1 Stakeholders

Federal, state, local, and private entities use LULC data routinely for descriptive, analytic, and persuasive purposes.

4.2 Data Sources

Two USGS programs have developed statewide LULC data. These programs are the National Land Cover Dataset (NLCD) developed for the Multi-Resolution Land Characteristics (MRLC) project and the GAP data developed for the National Gap Analysis Program. Both datasets are currently available through INSIDE Idaho, Idaho's officially designated GIS data clearinghouse.

In both programs, Landsat Thematic Mapper (TM) data was processed to develop the LULC data. The NLCD has more detailed land use classes and uses a modified Anderson Level-2 schema. GAP data emphasizes vegetation information and uses the National Vegetation Classification System. Both datasets are intermediate-resolution data appropriate for regional or statewide applications. These two datasets comprise the core of statewide LULC data.

The USGS has a HR LULC Mapping program that has been developing LULC data for selected areas based on partnerships. The data is compatible with data developed from current and past USGS LULC mapping programs, but no areas in Idaho have been developed.

4.3 Current Status

NLCD is complete for 1992 and is currently being updated to 2001 with completion expected in 2004. GAP data is complete for 1992/1993. GAP doesn't have a regular update schedule. However, there are tentative plans for a northwest regional GAP (including Idaho) beginning in the next couple of years, funds permitting.

4.4 Business Needs

LULC data are needed for monitoring urban growth, land use planning, forest planning, monitoring how land use changes affect the environment, establishing land use and land management policies, assessing ecosystem status and health, modeling nutrient and pesticide runoff, watershed management, environmental inventories, wildlife habitat assessment, transportation modeling, fire risk assessment, water resources monitoring, and land management.

4.5 Challenges

Satisfying a wide variety of needs for LULC classes of interest, levels of detail, accuracy, and timeliness is the primary challenge.

5. STANDARDS

The NLCD data has 21 LULC classes developed from digital classification of 1992 Landsat TM data. Details of the 1992 NLCD project are available at <http://landcover.usgs.gov/prodescription.html>. It is intended primarily for intermediate scale applications. The data is in the process of being updated to 2001. The 2001 data will also offer ancillary data compatible with the LULC, including Tasseled Cap transformed data (for early, peak, and late season), slope, aspect, elevation, soil moisture estimates, imperviousness, and tree canopy density. Detailed metadata with classification rules will also be included to allow users the opportunity to modify the classification to better fit their needs. Details of the 2001 NLCD project are available at http://landcover.usgs.gov/natlandcover_2000.html.

The GAP data has 82 LULC classes developed from digital classification of 1992 and 1993 Landsat TM data. This dataset has a two-hectare minimum mapping unit (MMU) and is intended for use at scales greater than 1:100,000. Details of the GAP project are available at http://www.wildlife.uidaho.edu/idgap/idgap_landcover.asp.

The USGS HR LULC mapping program has over 75 classes and is usually developed from one-meter digital orthophotos. The data has a 2.5- to 5-acre MMU. The data are compiled by 1:24,000-scale quads. More details are available at <http://mac.usgs.gov/mac/isb/pubs/factsheets/fs18999.html>. The USGS HR LULC data or similar HR data is especially useful in urban areas where LULC features are smaller than the MMU and so may not be generalized in the NLCD and GAP data.

The GAP and NLCD programs have held meetings over the last few years and will continue meeting to work toward reconciling the classification schemes as much as possible.

6. IMPLEMENTATION STRATEGY

6.1 Implementation Approach

The goals are to build on current statewide LULC data and to recommend a standard high resolution LULC system for use in local areas. To achieve the first goal, we propose using data from current USGS LULC mapping programs--NLCD and GAP. These are the most current LULC data available statewide. To achieve the second goals, the USGS HR LULC data standards will be recommended for use by local and regional LULC mapping projects. An incidental benefit is the partnerships with USGS that are expected to emerge.

6.2 Implementation Team

Natural teammates are the USGS and INSIDE Idaho. The USGS creates NLCD, GAP, and HR LULC data. NLCD and GAP data are distributed through INSIDE Idaho.

6.3 Data Development

The NLCD and GAP have already been developed. HR data can be developed as needed. Statewide and HR LULC data could be merged to create hybrid datasets as needed. It is prohibitively expensive to develop one statewide set of LULC data that would fit the needs of all government agencies. Our practical approach builds on LULC data that has been developed or will be developed by existing LULC mapping programs.

Other local and regional LULC data should also be tracked and made available. Data of local and regional areas may contain more detail than the NLCD or GAP data and could be merged with these data to create hybrid datasets. HR LULC data may be developed from satellite data, from digital orthophotos, or from scanned and rectified aerial photographs. Although HR LULC data is prohibitively expensive to develop statewide, it is useful for local areas where more detail is required.

Field data is often collected to help develop LULC data and for accuracy assessment. Field data typically covers a small sample of a project study area. It is important historical data for specific sites, expensive to collect and should be made available along with the LULC data.

The update cycle for NLCD is every ten years. The update cycle for the USGS HR data depends on project needs.

6.4 Data Maintenance

Maintenance would consist of obtaining and processing updated versions of the NLCD, GAP data, and other local and regional LULC data. Processing would involve projecting updated data to the projection currently designated as the Idaho standard projection. It would be the responsibility of the agency developing the local or regional data to make the data available to INSIDE Idaho.

6.5 Data Distribution

LULC data will be available through INSIDE Idaho, including local and regional data. Besides the LULC datasets, all related field data should be made available through INSIDE Idaho.

6.6 Implementation Schedule

The NLCD and GAP data are already developed. HR data will be developed as needed for specific agency and project needs.

6.7 Cost Estimates

The NLCD and GAP are complete, and the NLCD is being updated from 1992 to 2001. The USGS HR data costs about \$4,500 per quad so the cost for the entire state would be about \$7.7 million. This high cost drives the recommendation to use NLCD and GAP for most of the state and use HR data where the need is critical.

7. RECOMMENDATIONS

7.1 Recommendations for Institutional and Financial Initiatives

USGS HR LULC data is developed through partnerships with other agencies. Agencies developing new LULC data at this level should discuss cost-sharing agreements with other interested agencies and the USGS.

7.2 Recommendations for Data Stewardship and Integration.

The data will be developed under current USGS LULC mapping programs. USGS also performs the role of Integrator.

7.3 Recommendations for Legislative Initiatives

None at this time.

7.4 Recommendations for Policy, Rule and Procedural Changes

None at this time.

7.5 Recommendations for Data Standards

We recommend that Idaho use NLCD and GAP data developed by USGS. It is also recommend that agencies developing more detailed LULC for local areas use the USGS High-Resolution Standards.

8. PLAN UPDATE CYCLE

This plan will be reviewed at least annually and updated as appropriate.